

Lesson Plan: Coastal Geography Fieldwork (RHB)

Activity Details Summary

Location: *Robin Hood's Bay (usual meeting point is agreed carpark in top of village Station Car Park).*

Duration: *Full day, timings and order of activities will depend on tides and sea conditions*

Age Range: *GCSE and A-level students*

Max group size: *30 students per Activity Leader*

Subject: *Geography*

Activity Type: *Coastal Fieldwork*

Risk assessment: *Robin Hood's Bay Coastal Risk Assessment*

Main Curriculum Links

Coastal processes (such as longshore drift and erosion) and how these are managed

Learning Objectives

Knowledge and Understanding

- *Gain a greater understanding of coastal processes (in particular longshore drift; erosion, including attrition and abrasion; how geology shapes the coastline).*
- *Consider how coastal erosion can be managed, including describing and assessing different types of coastal defence to build up a case study example of coastal management.*
- *Gain a greater understanding of fieldwork techniques and how a coastal fieldwork investigation can be undertaken.*

Skills and Personal & Social Development

- *Independent learning, through research pre and post visit and during small group tasks in the field.*
- *Co-operation and problem solving skills during practical fieldwork tasks.*

Learning Styles

For aural learners: *Instructions and background information on the coastal defences and coastal processes around Robin Hood's Bay delivered orally. AFL discussions and questioning used by activity leader to engage students and check understanding.*

For visual learners: *Maps, old photos and seeing 'real world' casebook examples embedded into the day.*

For kinetic learners: *Practical fieldwork tasks throughout the day and carefully selected route around defences to ensure students are regularly moving and to take into account weather and sea conditions.*

Equipment Required:

Coastal defences and village:

- *Bi-polar recording sheets (x1 per student)*
- *Defence maps to fill in (x1 per student)*
- *Cost benefit recording sheets (x1 per student)*
- *Geology A3 map (x1)*
- *East Coast A3 map to locate study (x1)*
- *A3 Map of village/defences (x1)*
- *Old photos of village and storm photos*

Safety equipment including:

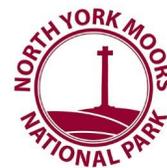
- *Mobile phone*
- *Throwline*
- *First aid kit*

Beach survey material:

- *Clinometers*
- *Metre rulers*
- *Tape measures*
- *Random numbers tables*
- *Rulers*
- *Cailleux roundness and Power's charts*

Activity Outline:

Half the day is spent doing a tour of the coastal defences; collecting field data on each of the defences, discussing coastal processes and building up a case study example of coastal management. The other part of the day (during low tide) is spent collecting data on the size and profile of the beach and size and shape of beach material to assess the impact of longshore drift and the seawalls.



Introduction:

- Introduce Robin Hood's Bay, and locate it and NYMNP on the map of the north east of England.
- Briefly introduce the history of the town (fishing, trains and tourism and coastal erosion).
- H&S information (stay in groups, stay away from the sea and cliffs, hazard of roads and weather).
- Brief outline of day and objectives for the day.
- Set up the days investigation aim and consider hypotheses.
- Toilet stops and when lunch is likely to be.

The Activity: (activity order depends on tides. The tide needs to be partially out for pebble fieldwork and almost completely out for beach profiles)

Coastal Defences and Management (1½ hours):

Starting at either the Northern or Southern end of the Village, go past each of the 5 defences and the unmanaged cliff-line just north of the seawall built in 2000, as listed in on both the bi-polar sheets and cost-benefit sheets. At each defence: (1) ask students to mark the location on their map; (2) make brief notes describing the defence, and advantages and disadvantages of the defence on the bi-polar sheet; (3) complete a bi-polar analysis (you will need to talk through this at the first site); (4) Count the properties to complete the cost-benefit sheet. **Mini-reviews:** To check understanding (1) ask students to check partners notes and suggest improvements (2) 'just a minute' on the defence (3) pointing quiz.

Pebble data fieldwork (1¼hours):

At two sites (one at the northern end of the old village near the 2000 seawall, and one at the southern end near the quarterdeck) layout a tape measure over 10m. Using random numbers each group find a series of pebbles (the closest pebble to their random number) repeating this to collect 50 pebbles of data between the whole group. Go through:

- Random sampling (with A-level groups why we are using random sampling)
- measuring the a, b and c axis of each pebble
- Power's scale (briefly outline its subjective nature)
- Cailleux roundness calculations

As groups finish ask them to either fill in the methods sheet or make brief videos summing up the methodology on their phones. **Mini-review:** Recap hypotheses and discuss the pro and cons of each method.

Beach profile fieldwork (1¼ hours):

First of all go through how to collect profile data with x2 metre rules, a clinometer and tape measure. This works well in groups of 3 or 4. Explain the need to stay away from the sea and cliffs and where to find you in an emergency then spread out to the 7 sites in front of each defence and to the North and South of the village.

Extension activities:

- **Beach run:** have a race on the beach. Afterwards discuss how easy it is to run on sand compared to tarmac, as the movement of beach sediment absorbs your energy through sound and friction, in the same way it absorbs a wave's energy. Therefore the bigger the beach the better protected the coast.
- **Being waves:** students model being destructive waves (tall and frequent coming into the beach head on with a strong backwash and small swash and look at how this shapes the beach, and repeat being calmer constructive waves on knees at oblique angle – see how this shapes the beach moving sand).
- **Lithology:** randomly sample 100 or 50 pebbles and sort into types, then record and discuss the origin of material and link this to ice flow during the last ice age. You could compare two different locations and link this to a Hypothesis around where you might expect more local material.
- **Storyboard:** tell a 6 paragraph story and students create a picture in 30 seconds, selecting the key information. Mini-review: students compare each-others pictures & add details - link to metacognition.
- **Field-sketch and old photos:** create a field sketch or skitch on iPad; this can be extended by comparing a current scene to an old photo of the coastline.
- **Wave fieldwork:** count waves using the wave recording sheet, defining them as destructive or constructive. Can compare different sites, considering where most at risk from destructive waves is.

Summing up and review of learning:

- *Students compare notes and discuss where the smallest beach seemed to be and why.*
- *Briefly return to the day's original hypotheses, consider the evidence to accept/reject these.*
- *Outline what students could do post visit to follow up on the investigation.*

Possible Pre and post session activity suggestions include:**Before coming out on fieldwork visit:**

- *Teach about key concepts related to coasts, such as those listed on coversheet.*
- *Introduce the study site using the online North York Moors National Park PowerPoint.*

Post visit:

- *Collate data on North York Moors National Park spreadsheets for pebble data and profile data, use this as a stimulus to (1) consider different ways to present data (2) with A-level groups consider statistical tests which could be done on the data (3) return to the investigation key questions/hypotheses.*
- *Present beach profile cross section data on Google Earth (utilizing GE graph).*
- *Pull together all the information about different coastal defences and summarise using the Geo-located North York Moors National Park PowerPoint.*